



Advanced Biofuels Canada  
*Biocarburants avancés Canada*

## **Clean Fuel Policy Design: Into Uncharted Waters**

*BioDeisgn*  
*September 10, 2020*

**Fred Ghatala, Director Carbon & Sustainability**

# Advanced Biofuels Canada



*We support the production and use of non-fossil, low carbon renewable and synthetic fuels:*

- **Fuel Regulations** - RFS & LCFS
- **Fuel Taxation** - fuel & carbon tax
- **Capital Investment** - programs and tax policies
- **Carbon Pricing** – design/application
- **Standards** – CGSB, LCA, ISO



- ◆ Production
- Processing
- Office/Research





# Advanced Biofuels Canada: Member Profile

## Technologies:

### *Innovation*

- Bio-chemical
- Biomass co-processing
- CAT-HTR™
- Catalytic de-polymerization
- Catalytic upgrading
- Ecofining™
- Ensel™
- Gas fermentation
- Hydrofaction™
- Hydrotreating
- RTP™
- Thermo-chemical
- Transesterification

## Products:

### *Low Carbon Fuels*

- Advanced Ethanol
- Biocrude
- Biodiesel
- Biogas (H<sub>2</sub>, RNG)
- Biojet
- Bio-methanol
- Renewable Fuel Oil
- Renewable Gasoline
- Renewable Hydrocarbon Diesel (HDRD)
- Synthetic Diesel

## Co-Products:

### *Bio-Products*

- Animal feed & nutritional supplements
- Bio-chemicals
- Fatty acids
- Glycerin
- Green polymers
- Light & heavy fuel 'ends'
- Liquid CO<sub>2</sub>
- Phosphate
- Renewable naphtha
- Renewable Liquid Petroleum Gas (R-LPG)



## Key Messages:

- Transport GHG policies are transforming the sector:
  - *Low Carbon Fuel Standards (LCFS) increasing adoption beyond biofuel blend requirements (RFS).*
  - *LCFS are expanding to include upstream and downstream petroleum GHG reduction opportunities: 4Rs (Reduce, Reuse, Recycle, Remove).*
- New integration opportunities are emerging for lower carbon fossil fuels and renewable fuels.
- Policy design will determine compliance pathways, investment flows, and technology deployment.



# Transforming Policy Driven Markets

- Renewable fuel mandates → biomass-based renewable fuels
  - ✓ FAME Biodiesel
  - ✓ Ethanol
  - ✓ Renewable diesel (HVO)
- Low carbon fuel standards → renewable + alternative fuels + **4R's**
  - ✓ Synthetic fuels (Direct Air Capture)
  - ✓ Electric Vehicles, Hydrogen, & NG/Propane switching
  - ✓ Co-processed biocrude fuels AND credits from fossil fuel improvements

Significant Change in Policy Scope

# Canada Renewable/Low Carbon Fuel Mandates

## Provincial Mandates

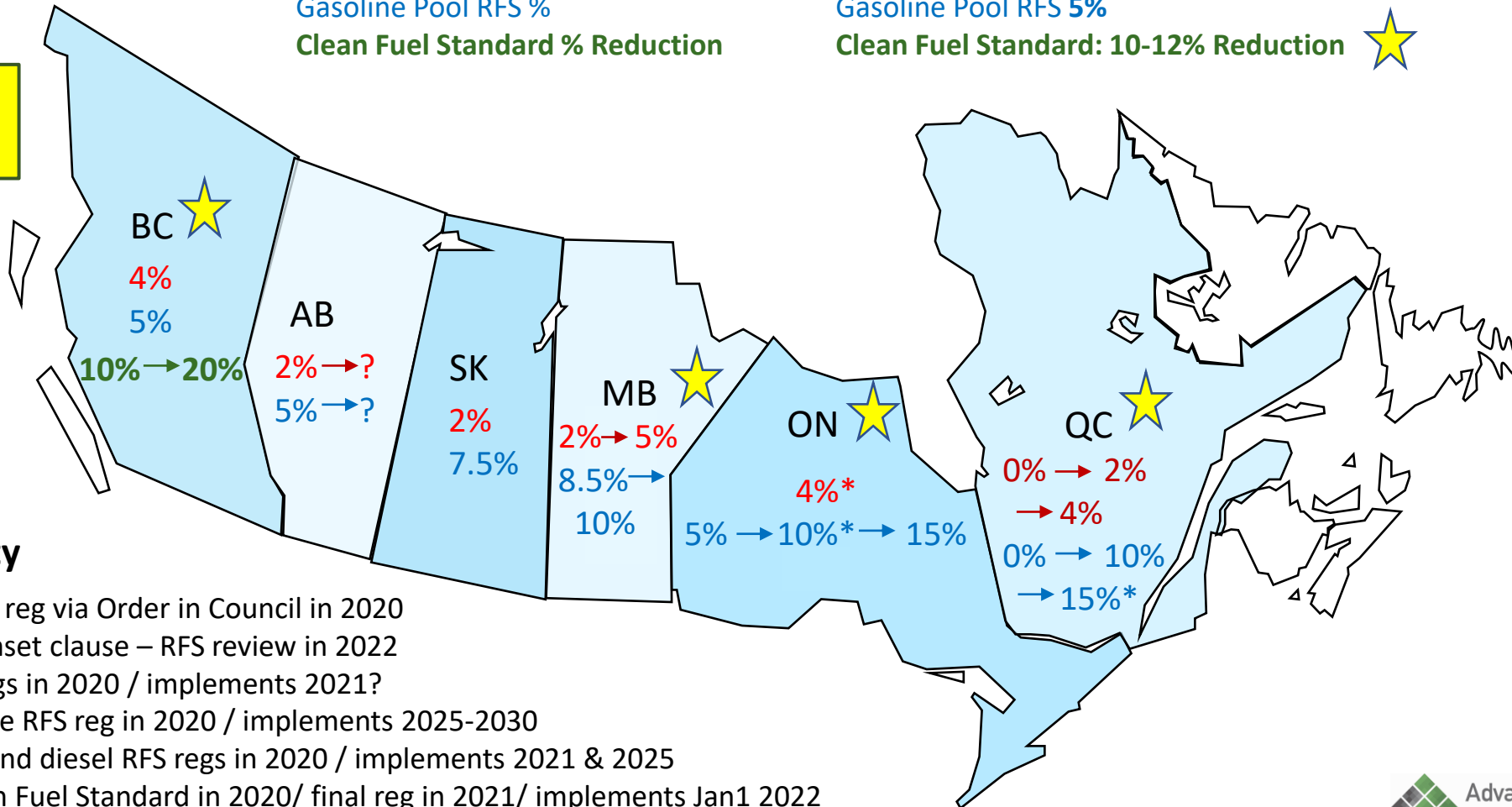
Diesel Pool RFS %  
Gasoline Pool RFS %  
Clean Fuel Standard % Reduction

## Federal Mandates

Diesel Pool RFS 2%  
Gasoline Pool RFS 5%  
Clean Fuel Standard: 10-12% Reduction ★

Draft / Final  
Regulations: 2020

- Increasing blend levels
- Compliance credit systems



## Current Activity

BC: expanded LCFS reg via Order in Council in 2020  
 AB: eliminated sunset clause – RFS review in 2022  
 MB: amend RFS regs in 2020 / implements 2021?  
 ON: amend gasoline RFS reg in 2020 / implements 2025-2030  
 QC: new gasoline and diesel RFS regs in 2020 / implements 2021 & 2025  
 Federal: draft Clean Fuel Standard in 2020/ final reg in 2021/ implements Jan1 2022

# Canada's Federal *Clean Fuel Standard*

- 30 million tonnes of *incremental emissions reductions*
- Canada released the *Proposed Regulatory Approach* (Jun28-19)
- Liquid fuels (2022) followed by solid, gaseous fuels (2023)
- 12gCO<sub>2</sub>e/MJ carbon intensity reduction requirement (2030)
- LCA – new model under development
- ILUC — EU Delegated Act approach

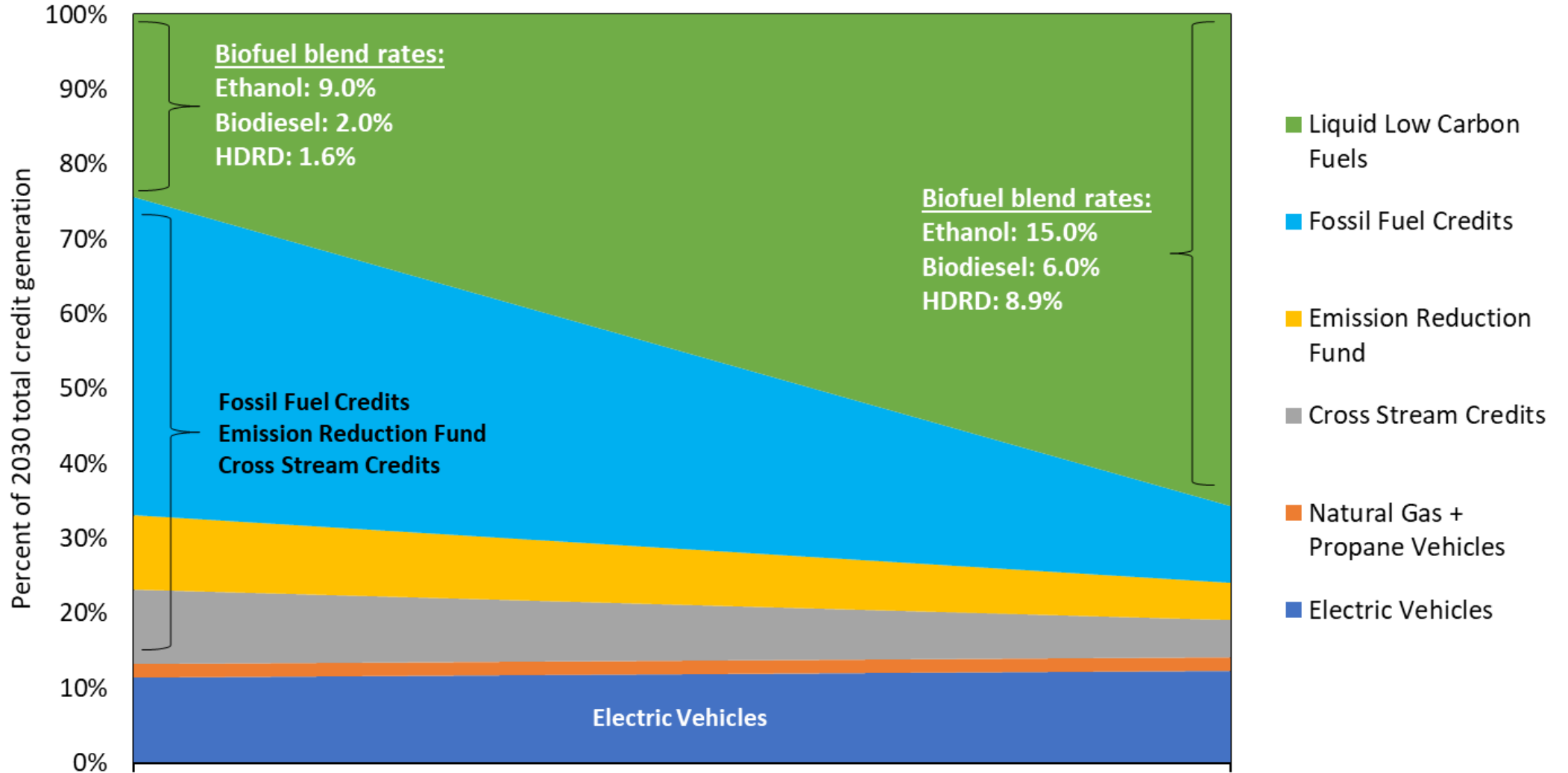
## Compliance Options - Liquids:

- |                   |  |
|-------------------|--|
| Category 1 (CC1): | Actions to reduce CI throughout the lifecycle of fossil fuel production (e.g. CCS, process efficiency, NG electric drive compression, co-processing, etc.) |
| Category 2 (CC2): | Supply low carbon-intensity fuels (biofuel)  |
| Category 3 (CC3): | Selected end use fuel switching in transportation (e.g. EV, RNG, CNG, LNG, H <sub>2</sub> )  |

*“The CFS will be a performance-based approach designed to **incent the innovation and adoption of clean technologies in the oil and gas sector** and the development and use of low-carbon fuels throughout the economy.”*



# Regulation Design will Determine Compliance Approach



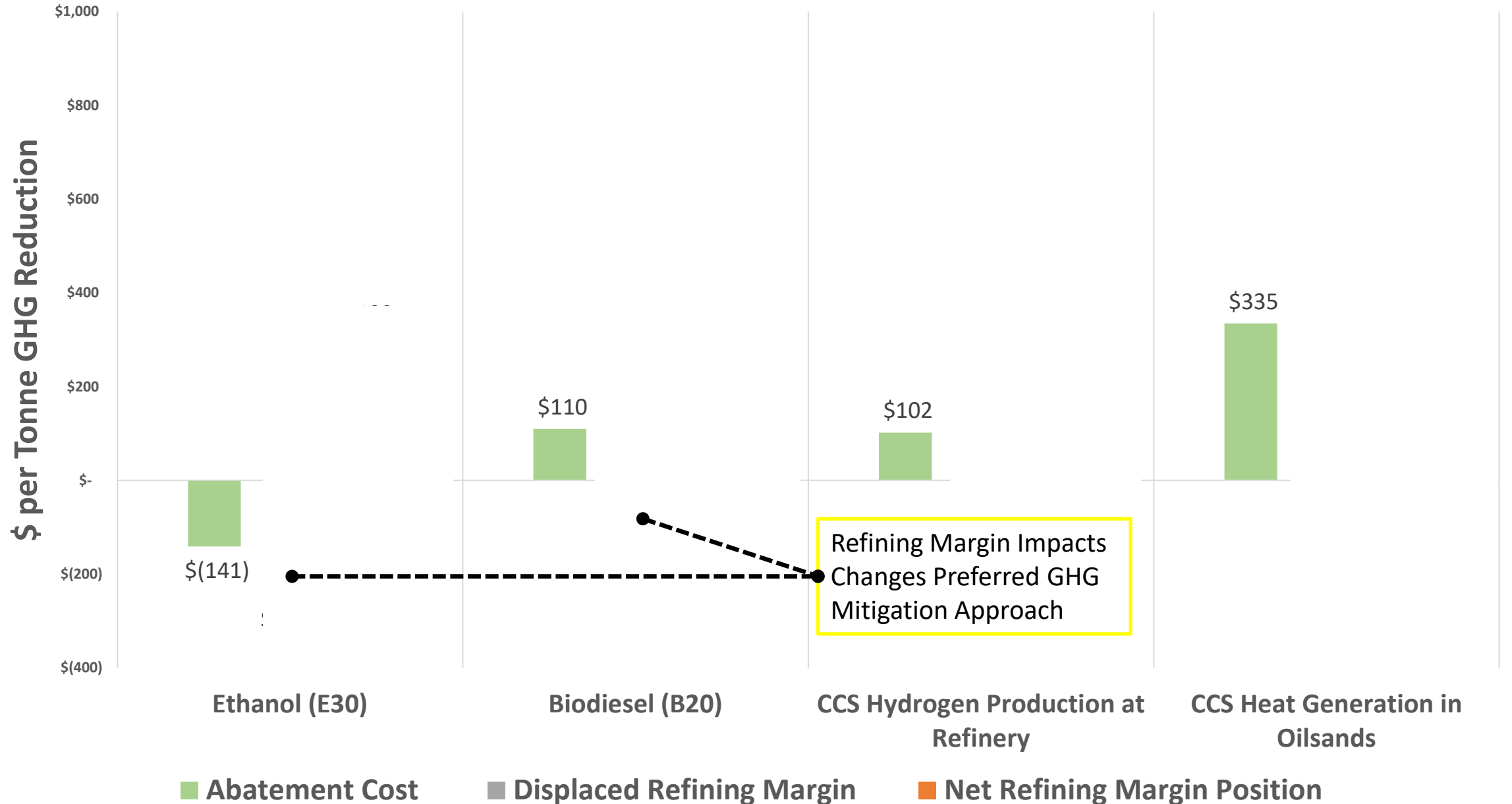
**High FF Credits vs. Biofuels/EVs (65:35)**

\* Note – Renewable Hydrocarbon Diesel (RHD/HDRD) can include SAF, renewable Heavy Fuel Oil/Light Fuel Oil. Co-refined biomass (biocrude) creates fossil fuel offset credits.

**Low FF Credits vs. Biofuels/EVs (20:80)**



# Opportunity Cost vs. GHG Abatement Cost





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fghtala@advancedbiofuels.ca

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